Beyond us and them: A mixed method approach supporting a virtual scientific interdisciplinary organization

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ABSTRACT
This paper studies the need within a geographically dispersed, virtual, interdisciplinary institute, the IBBT, how the collaboration within this organization could be enhanced by looking into the current collaboration practices. The IBBT performs research and supports ICT innovation in the region of Flanders and acts as a central institute between different research groups located at five different cities. Therefore a combination of four methods in different phases of data collection was applied to create a mixed method participatory User Centered Design approach with specific attention to the appropriation of current social tools. This research is targeted at understanding the different research groups of the IBBT and finally supplying the organization with suggestions and solutions to improve the collaboration between the different research partners. Through our approach we get an overview of the current practices and CSCW-tools used within the research groups themselves and in the collaboration with other IBBT research groups and external partners. They lead to the formulation of a set of needs and requirements to how the groups see their future activities facilitated by a set of tools. The mixed use of methods is evaluated at the end regarding their successful complementary use in pursuit of these requirements.

Author Keywords
Virtual teams, interdisciplinary collaboration, CSCW, participatory, user centered design, UCD

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H.5.3 Group and Organization Interfaces: Computer-supported cooperative work, H.5.2 User Interfaces: User-centered design.

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INTRODUCTION

The subject of this paper is a study on the interdisciplinary collaboration within a Flemish institute, the IBBT, which is focused on the development and innovation of ICT in the region. The IBBT is a collective of seventeen research groups dispersed over different universities in five cities of Flanders. Because of this geographical dispersed locality of the research groups, the IBBT as the overarching institute has a certain virtual character, to act as the centre of all activities by offering its administrative and logistic resources. The research groups also all differ in their knowledge and expertise resulting in different ways of communication and performing within joint projects.

Although the aim of this institute is to support and facilitate interdisciplinary collaboration, it is not sufficient to experience a true interdisciplinary knowledge creation process. For instance, in case of communication, although all researchers speak the same languages (i.e. Dutch and English), there are misunderstandings in the meaning of certain terms (e.g. in an interview with another IBBT researcher within this project there was a misunderstanding in the concept of a CT-scan). As misunderstandings are of great danger to a successful interdisciplinary project, making the different partners work together fluently is an essential precondition to reach the intended success. Coordinating the research groups also encounters difficulties because of this geographical dispersed character of the IBBT.

The project that is described in this paper was set up to gather insight in the everyday practices of the different groups, and to find and develop tools and procedures to enhance working in an interdisciplinary way, bridging the gap between "us" and "them". Offering the partners a chance to collaborate in a smooth manner will improve the output of the project and will facilitate the actual integration of interdisciplinary knowledge. To reach this smooth collaboration at the levels of the research groups, institute, projects... we first need to thoroughly understand each research group in terms of everyday functioning, organization, etc. In the following sections we will describe the different methods that were used in this project, and give a first indication of the insights this combined effort will offer on patterns and variations of collaborative practices within and between the research groups.

METHODS

To learn more about the research groups and their customs within the IBBT a multi-method user centred design approach was followed, in which four methods were combined. It is important to point out that these methods were not used in a parallel but in a complementary use. This mixed use of methods gave us the opportunity to collect certain information on different levels. Surveys were spread at the level of the individual researcher and at the level of the research group; the latter were also followed with additional interviews. The field trips are an up close observation of the research groups and are still going on at the time of writing. The workshops were an opportunity to allow the researchers to have an active role in this project.

The communal anchor we used in the different methods lay in the use of a distinction between communication, coordination and collaboration [1]. These anchors were used to maintain a consequent way of collecting information.

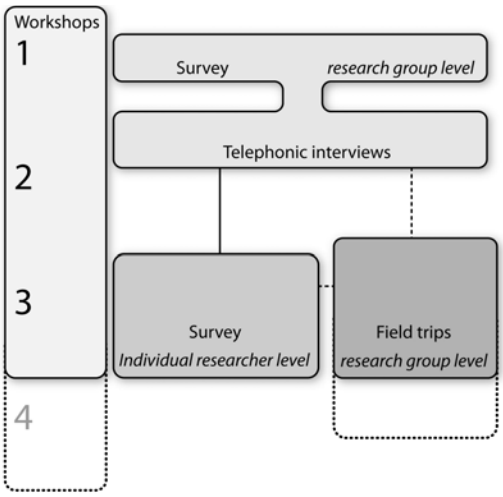

Figure 1. Combination of research results.

Workshops

During the project, four workshops are organized with representatives of each research group. At the time of writing, three of the four planned workshops have taken place. The goal of these workshops was to get direct input from the research groups, of which delegates were selected to form a user panel.

During the first workshop we started from preliminary insights based on CSCW literature [2, 3, 4, 5]. We split up the delegates of the different groups and then brainstormed, discussed and clustered the associations made with the term "collaboration". These associations were clustered on the current use and the frequency of this use in their research group. The insight of these brainstorm formed the basis of the topics questioned in the first survey (see below) and interview round with all research group coordinators (see below).

The second workshop targeted the three conceptual categories communication, coordination and collaboration. Faced with a professional scenario the tools were characterized with factors of non-use and solutions were given to overcome these factors. The last part was used to put the different categories communication, coordination and collaboration on a project's timeline to see where the attendants saw a suited moment to use these tools.

A third workshop was held recently and included a feedback moment, presenting the results of the second survey to the project coordinators and creating a discussion on several statements and issues of the survey. Some suggestions were also made for further data-analysis. We also threw in some extra questions, arising from the results of the survey and added these to our goals for future fieldtrips.

Online-Survey and telephonic interview

A first overview of the current use of CSCW tools at the research groups within a (virtual) multidisciplinary collaboration was provided by a survey. The tools were split up in 3 conceptual categories (communication, coordination and collaboration) and questions were asked regarding usage of the given tools in remote locations. The second aim of the survey was to describe the socio-demographic profile of the research groups by asking about distributions of age, gender, experience and mothertongue of the researchers. The survey was sent to the 17 coordinators of the IBBT research groups of which 14 responded. The survey was followed up by a telephone interview with the coordinators, going into more detail regarding the answers given in the survey. First, it gave us a more complete view of the current CSCW tools used by the researchers. The resulting list of exemplary tools covered most of the groups. Second, the interviews included questions to provide an insight into the reasons and motives why a certain tool would or would not be used. Finally, the organization of the research group was questioned, based on information from the first workshop, and the relation

between organization and the use of certain CSCW tools was analyzed.

This research phase showed that within current collaboration practices, email and phone remain the dominant communication tools. In the context of coordination, privacy is a major issue (e.g. the use of a shared calendar) and social network sites are mainly regarded as spam generators. For active collaboration, some typical facilities such as a central server within a group are commonly used, but more advanced tools remain rare.

Broad online-survey

Based on the insights of the previous research steps and on a literature review, an online survey was developed and distributed to every IBBT employee. We asked the respondents to indicate their opinions regarding a set of 32 statements. These statements were the operationalisation of four clusters found during the literature review and with some dimensions added during the second workshop. Respondents were also asked about their position in their group, their experience with and expectations towards CSCW tools and some relevant socio-demographic information. Eventually, 269 IBBT employees filled out the survey completely from the 696 that received an invitation. The 32 statements could be clustered in 4 factors. Factor 1 stands for statements expressing the considerations on the effort and impact of a contribution to the system. The second factor represents statements reflecting considerations on other people being involved in the task. It included statements such as “I will use this intranet when other project partners also contribute to it” and “I will use this intranet when all project members can use it.“. Factor 3 relates to statements compromising personality traits (e.g. “This intranet fits my workflow”). The final factor reflected considerations on the task or tool at hand and included statements such as “I will use this intranet when it is well built and programmed.”

Based on cluster analysis of the respondents' scores on the 4 factors, it appeared that four clusters of users could be identified within the respondent group. Cluster 1 can be called the ‘anything goes’-group. They have few demands for the use of CSCW-tools and do not require an (exact) fit with their lifestyle, personality or workflows. Cluster 2 can be called the ‘egocentric’-group. They need the CSCW-tools to fit with their personality, lifestyle and workflow, but do not consider it important how other people use the tool or whether these other people benefit from it or not. Cluster 3 can be called the ‘rationalist’-group. If the tool works fine for themselves and for others, then all is well, but they do not require the tool to fit their personality, lifestyle or workflow. Cluster 4 can be called the ‘critical’-group, as they show high demands on factors 1, 2 and 4 and they require the tool to fit with their personality, lifestyle and workflow.

However, to further complete the image, additional insights are needed. Previous research methods focused extensively on experiences of researchers at an individual level, although these researchers operate within varying organizational contexts. As such, observations of the IBBT researchers in their own working contexts are carried out.

Field trips

The field trips are developed from the perspective of a design ethnographic tradition. The two previous activities, were more retrospective, on a more distant and attitudinal level. The field trip was a week visit to every research group by one of the researchers in the project to look into depth into the practices within their offices and activities. The researcher got a desk within the offices and resided there during four to five days, organizing in depth-interviews during this week with four to five persons, as well as observing the group, the work habits, the formal and informal contacts, the rules and standards applied. The depth-interviews were scheduled before the visit and the participants differed on roles and experience. To facilitate these interviews pictures taken by the interviewee were used to create a view on their daily tasks and the research group’s habits and procedures.

The interviews were semi-structured mainly around the 3 categories and several other topics: group's history, in relation to the IBBT, their daily activities and tools they used to facilitate them. Where do meetings take place, how are they scheduled, do they use shared calendars,how do they collaborate on documents, are all these internal procedures the same with the external partners,...?. To reflect on the dimensions on which they perceived the current relationship with the other research groups, we provided them with an exercise originating from identity research. Would the groups further away be those with whom collaboration often fails, or is that neglected? In the analysis we will go into the dimensions that trigger a closer or further distance perception.

DISCUSSION

The mixed use of methods is a deliberate choice to, as stated above, get information at different levels of research (teams, research coordinator, and researcher). These methods also give us somewhat different sorts of information, such as the habits of a whole group observed in the field trips and the more individual view of the researchers themselves in the interviews. Each of these methods would be facilitated by the expertise of the different research groups in this project. The survey is a more superficial approach to get a view on the current situation, a more comprehensive view on the research groups could be reached by a broader survey. The questions on the use of CSCW-tools can be answered without any further explanation. The interview was a more personal approach to filter out the current situation at the research groups. Having direct contact with the research coordinators could result in more complete feedback on the questions asked in the survey.

In contrast with the surveys, the field trips were a more invasive method but not requiring the permanent effort of the members of the research group visited. The interviews, part of the field trip, then again could give us some explanation on certain observations made during the previous days. This specific difference of roles would give us different views on the research group and was also only used in the field trips.

The workshops were an opportunity to get the researchers together and let them brainstorm on the subject of virtual collaboration. This method relied heavily upon involvement of the users themselves to get substantial output to the other methods.

The mix of methods was facilitated by the use of the three categories communication, collaboration and coordination. These anchors could help us to create a format throughout the methods and make the results of each method transferable to the others. However, a clear definition of the different categories isn't found overnight as they all are dependant on each other. Coordination isn't possible without communication and collaboration neither without coordination.

CONCLUSION

As stated above these methods are all based on the expertise of the research teams involved in this project, so an adequate execution of the different methods was guaranteed. Of course certain risk factors still existed when using the different methods in the complementary way, when transferring the results of one method to another. The complementarity proved useful, e.g. the discussion about the non-use of the wiki-concept, because of its necessary push for activity to succeed, was possible because of clarification in the telephone interviews after the first interviews. Another example is the transition between the broader survey and the field trips, where the third workshop acted as a medium to add new questions to the scope of the field trips. They filled in each other's gaps and were effectively used to supply other methods with input.

The use of the three anchors became a real useful tool to have a common ground over all the methods. They gave structure when there was a less clear idea on how a task would be executed (e.g. structure of the interviews). Discussion on the exact definition of the categories and which tools belonged to one category or to another was a difficult exercise to make. The discussion would be without an end as the three categories rely heavily on each other and there is no clear separation between them.

The fact that this project itself is a collaboration of different geographically dispersed research groups is an accomplishment in itself and an interesting case regarding the topic of the project.

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